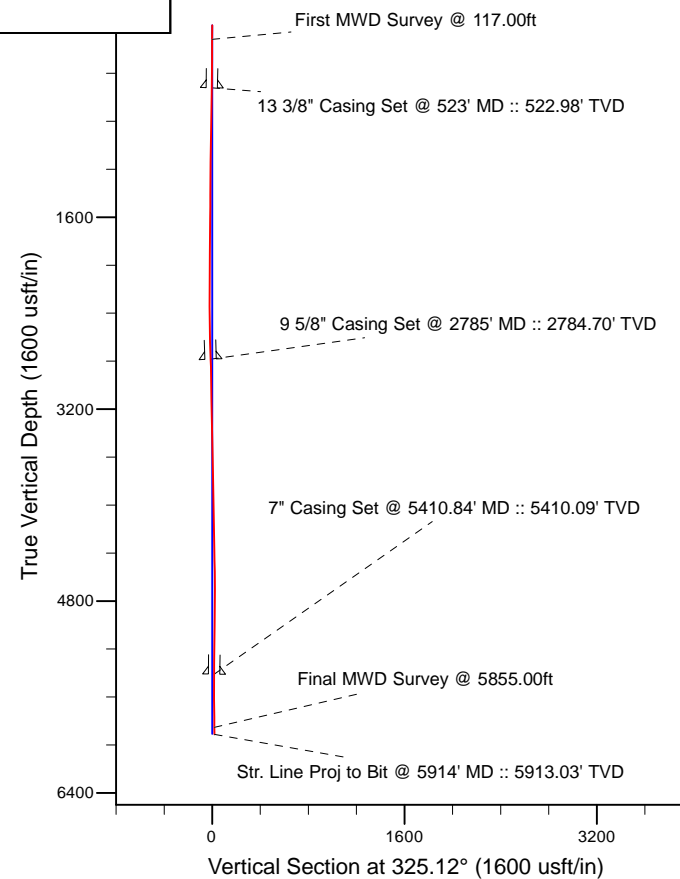
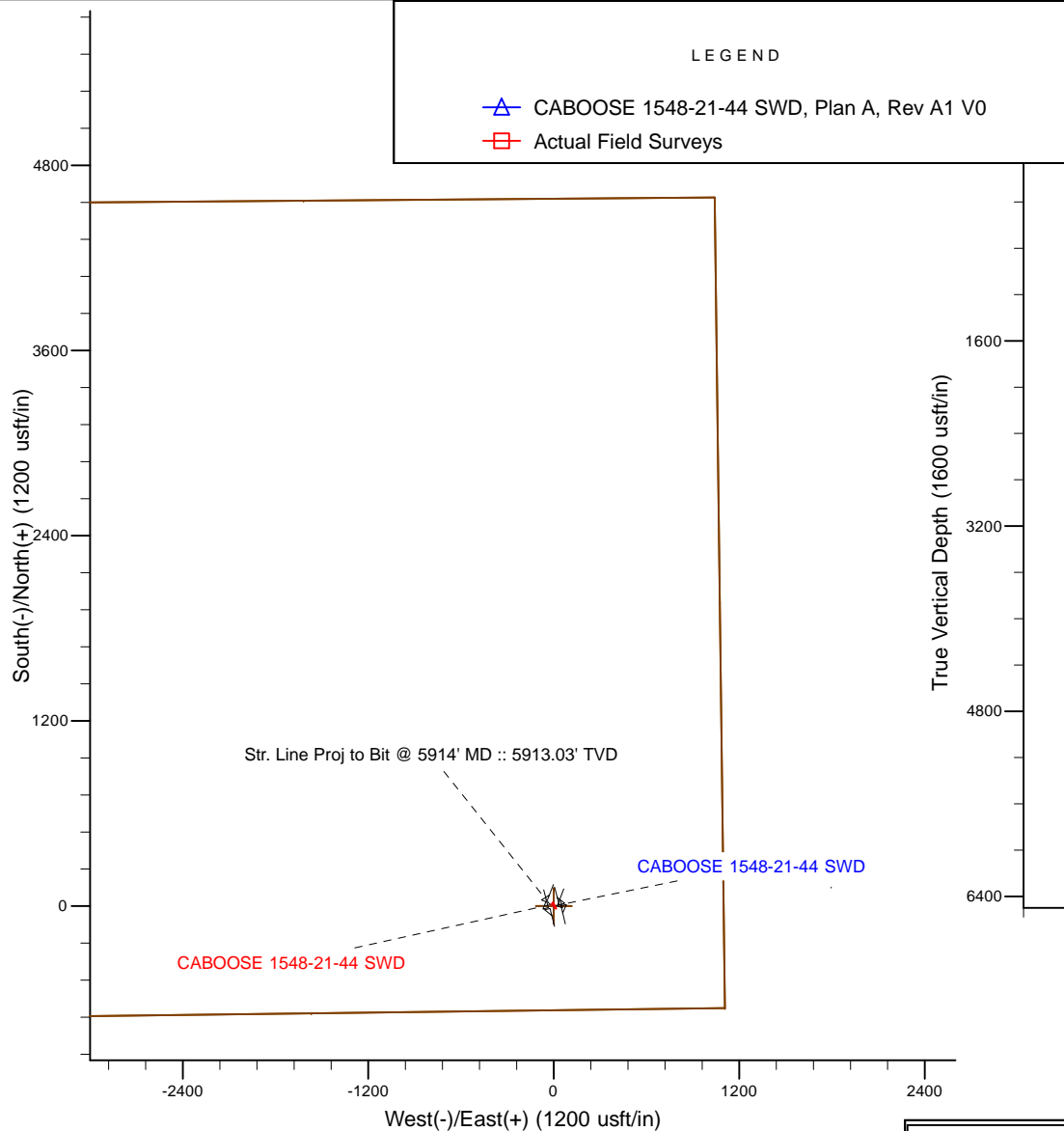


Project: Cheyenne County, CO (NAD 83)
Site: Sec. 21-T15S-R48W
Well: CABOOSE 1548-21-44 SWD
Wellbore: Plan A
Design: Actual Field Surveys



HALLIBURTON
Sperry Drilling



BHL: ~683.79' FSL, ~1121.76' FEL
Lat/Long: 38.722659 N, -102.779846 E
State Planes - WY Eastern: 1,335,506.23' N, 3,775,946.39' E
Location: Sec. 21-T15S-R48W

WELL DETAILS: CABOOSE 1548-21-44 SWD	
Ground Level:	4254.00
RKB = 19' @ 4273.00usft (Pioneer 54)	
Design: Actual Field Surveys (CABOOSE 1548-21-44 SWD/Plan A)	
Created By: Clint Eshelman	Date: 2/20/2014
Reviewed: _____	Date: _____

Anadarko Petroleum Corp.

Cheyenne County, CO (NAD 83)

Sec. 21-T15S-R48W

CABOOSE 1548-21-44 SWD

Plan A

Design: Actual Field Surveys

Sperry Drilling Services

Standard Report

20 February, 2014

Well Coordinates: 1,335,498.25 N, 3,775,968.52 E (38° 43' 21.49" N, 102° 46' 47.17" W)

Ground Level: 4,254.00 usft

Local Coordinate Origin:

Viewing Datum:

TVDs to System:

North Reference:

Unit System:

Geodetic Scale Factor Applied

Version: 5000.1 Build: 70

Centered on Well CABOOSE 1548-21-44 SWD

RKB = 19' @ 4273.00usft (Pioneer 54)

N

True

API - US Survey Feet - Custom

HALLIBURTON

Design Report for CABOOSE 1548-21-44 SWD - Actual Field Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
117.00	0.77	63.03	117.00	0.36	0.70	-0.11	0.66
First MWD Survey @ 117.00ft							
207.00	0.51	130.49	206.99	0.37	1.54	-0.58	0.83
297.00	0.53	67.08	296.99	0.27	2.23	-1.05	0.61
386.00	0.58	208.61	385.99	0.04	2.40	-1.34	1.18
469.00	0.56	181.92	468.98	-0.74	2.18	-1.85	0.32
523.00	1.12	165.33	522.98	-1.51	2.31	-2.56	1.12
13 3/8" Casing Set @ 523' MD :: 522.98' TVD							
534.00	1.24	163.82	533.97	-1.73	2.37	-2.77	1.12
595.00	1.51	160.67	594.96	-3.12	2.82	-4.17	0.46
686.00	1.32	166.73	685.93	-5.27	3.45	-6.30	0.27
777.00	1.11	171.64	776.91	-7.17	3.82	-8.06	0.26
868.00	0.83	157.44	867.90	-8.65	4.20	-9.50	0.40
959.00	0.44	153.73	958.89	-9.57	4.61	-10.49	0.43
1,051.00	0.59	147.34	1,050.89	-10.28	5.02	-11.31	0.17
1,142.00	0.40	108.78	1,141.88	-10.78	5.58	-12.03	0.41
1,233.00	0.56	108.91	1,232.88	-11.03	6.30	-12.65	0.18
1,323.00	0.79	103.31	1,322.87	-11.31	7.32	-13.46	0.27
1,418.00	0.94	96.32	1,417.86	-11.55	8.73	-14.47	0.19
1,513.00	0.97	101.61	1,512.85	-11.80	10.29	-15.56	0.10
1,608.00	0.68	116.01	1,607.84	-12.21	11.59	-16.64	0.37
1,703.00	0.31	108.34	1,702.84	-12.53	12.34	-17.34	0.39
1,798.00	0.33	100.13	1,797.83	-12.66	12.85	-17.74	0.05
1,894.00	0.45	122.68	1,893.83	-12.91	13.44	-18.28	0.20
1,989.00	0.90	134.52	1,988.83	-13.64	14.29	-19.36	0.49
2,084.00	0.62	136.22	2,083.82	-14.53	15.17	-20.60	0.30
2,179.00	0.33	203.39	2,178.81	-15.16	15.42	-21.25	0.61
2,274.00	0.12	272.64	2,273.81	-15.40	15.21	-21.33	0.32
2,369.00	0.32	318.90	2,368.81	-15.20	14.94	-21.01	0.27
2,464.00	0.56	339.19	2,463.81	-14.56	14.60	-20.30	0.30
2,559.00	1.31	352.28	2,558.80	-13.05	14.29	-18.88	0.82
2,654.00	1.74	348.91	2,653.76	-10.56	13.86	-16.59	0.46
2,736.00	1.81	334.40	2,735.72	-8.17	13.07	-14.18	0.55
2,785.00	2.12	346.36	2,784.70	-6.59	12.52	-12.57	1.05
9 5/8" Casing Set @ 2785' MD :: 2784.70' TVD							
2,790.00	2.16	347.37	2,789.69	-6.41	12.47	-12.39	1.05
2,845.00	1.57	341.88	2,844.66	-4.68	12.01	-10.71	1.12
2,940.00	0.93	318.82	2,939.64	-2.87	11.10	-8.70	0.84
3,035.00	0.96	319.04	3,034.63	-1.68	10.07	-7.14	0.03
3,131.00	1.00	326.03	3,130.61	-0.38	9.08	-5.50	0.13
3,226.00	1.00	323.27	3,225.60	0.97	8.12	-3.85	0.05
3,321.00	1.19	328.29	3,320.58	2.47	7.10	-2.03	0.22
3,416.00	1.23	333.00	3,415.56	4.22	6.12	-0.04	0.11
3,511.00	1.27	330.66	3,510.54	6.05	5.14	2.02	0.07
3,607.00	1.20	330.87	3,606.52	7.85	4.13	4.08	0.07
3,702.00	1.22	332.51	3,701.49	9.62	3.18	6.07	0.04
3,797.00	1.10	332.23	3,796.47	11.32	2.29	7.98	0.13
3,892.00	1.11	334.91	3,891.46	12.96	1.48	9.79	0.06
3,988.00	1.08	333.13	3,987.44	14.61	0.67	11.60	0.05

Design Report for CABOOSE 1548-21-44 SWD - Actual Field Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
4,083.00	1.00	336.58	4,082.42	16.17	-0.06	13.30	0.11
4,177.00	0.94	333.72	4,176.41	17.62	-0.73	14.87	0.08
4,273.00	0.94	329.67	4,272.40	19.00	-1.48	16.43	0.07
4,368.00	1.00	325.92	4,367.38	20.36	-2.33	18.04	0.09
4,463.00	1.05	326.17	4,462.37	21.77	-3.28	19.74	0.05
4,559.00	1.00	323.10	4,558.35	23.17	-4.28	21.45	0.08
4,654.00	0.44	241.13	4,653.35	23.66	-5.09	22.32	1.09
4,749.00	0.74	218.24	4,748.34	23.00	-5.79	22.18	0.40
4,844.00	0.80	216.98	4,843.33	21.99	-6.57	21.80	0.07
4,939.00	0.72	210.39	4,938.33	20.94	-7.27	21.34	0.12
5,035.00	0.88	204.27	5,034.32	19.75	-7.88	20.71	0.19
5,130.00	1.18	196.95	5,129.30	18.15	-8.46	19.73	0.34
5,225.00	1.11	195.99	5,224.28	16.33	-9.00	18.54	0.08
5,358.00	1.10	193.34	5,357.26	13.85	-9.65	16.88	0.04
5,410.84	1.28	201.00	5,410.09	12.81	-9.98	16.21	0.45
7" Casing Set @ 5410.84' MD :: 5410.09' TVD							
5,474.00	1.51	207.67	5,473.23	11.41	-10.62	15.43	0.45
5,537.00	1.31	227.44	5,536.21	10.19	-11.54	14.96	0.83
5,632.00	1.15	282.30	5,631.19	9.66	-13.27	15.51	1.20
5,725.00	1.33	294.38	5,724.17	10.30	-15.16	17.12	0.34
5,855.00	2.69	246.88	5,854.09	9.73	-19.34	19.04	1.57
Final MWD Survey @ 5855.00ft							
5,914.00	2.69	246.88	5,913.03	8.64	-21.89	19.60	0.00
Str. Line Proj to Bit @ 5914' MD :: 5913.03' TVD							

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	+E/-W (usft)	Comment
117.00	117.00	0.36	0.70	First MWD Survey @ 117.00ft
5,855.00	5,854.09	9.73	-19.34	Final MWD Survey @ 5855.00ft
5,914.00	5,913.03	8.64	-21.89	Str. Line Proj to Bit @ 5914' MD :: 5913.03' TVD

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/_S (usft)	+E/-W (usft)	Start TVD (usft)
User	No Target (Freehand)	325.12	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
117.00	5,855.00	MWD Vertical Surveys	MWD+SC

Design Report for CABOOSE 1548-21-44 SWD - Actual Field Surveys**Casing Details**

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
523.00	522.98	13 3/8" Casing Set @ 523' MD :: 522.98' TVD	13-3/8	17-1/2
2,785.00	2,784.70	9 5/8" Casing Set @ 2785' MD :: 2784.70' TVD	9-5/8	12-1/4
5,410.84	5,410.09	7" Casing Set @ 5410.84' MD :: 5410.09' TVD	7	8-3/4

Wellbore Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Caboose 1548-21-44_ - actual wellpath hits target center - Point	0.00	0.00	0.00	0.00	0.00	1,335,498.25	3,775,968.52	38° 43' 21.486 N	102° 46' 47.168 W
Caboose 1548-21-44_ - actual wellpath hits target center - Polygon	0.00	0.00	0.00	0.00	0.00	1,335,498.25	3,775,968.52	38° 43' 21.486 N	102° 46' 47.168 W
Point 1				0.00	4,550.75	-4,277.92	1,339,918.70	3,771,556.47	
Point 2				0.00	4,571.03	-1,618.10	1,340,018.59	3,774,214.37	
Point 3				0.00	4,591.32	1,041.73	1,340,118.50	3,776,872.29	
Point 4				0.00	1,964.92	1,075.13	1,337,494.39	3,776,984.30	
Point 5				0.00	-661.48	1,108.53	1,334,870.28	3,777,096.31	
Point 6				0.00	-694.20	-1,568.12	1,334,757.44	3,774,421.96	
Point 7				0.00	-726.91	-4,244.76	1,334,644.62	3,771,747.61	
Point 8				0.00	1,919.17	-4,263.30	1,337,288.84	3,771,649.86	
Point 9				0.00	4,550.75	-4,277.92	1,339,918.70	3,771,556.47	

Directional Difficulty Index

Average Dogleg over Survey:	0.37 °/100usft	Maximum Dogleg over Survey:	1.57 °/100usft at 5,855.00 usft
Net Tortousity applicable to Plans:	0.37 °/100usft	Directional Difficulty Index:	3.331

Audit Info

North Reference Sheet for Sec. 21-T15S-R48W - CABOOSE 1548-21-44 SWD - Plan**A**

All data is in US Feet unless otherwise stated. Directions and Coordinates are relative to True North Reference.

Vertical Depths are relative to RKB = 19' @ 4273.00usft (Pioneer 54). Northing and Easting are relative to CABOOSE 1548-21-44 SWD

Coordinate System is US State Plane 1983, Colorado Central Zone using datum North American Datum 1983, ellipsoid GRS 1980

Projection method is Lambert Conformal Conic (2 parallel)

Central Meridian is 105° 30' 0.000 W°, Longitude Origin:0° 0' 0.000 E°, Latitude Origin:39° 45' 0.000 N°

False Easting: 3,000,000.00usft, False Northing: 1,000,000.00usft, Scale Reduction: 0.99995759

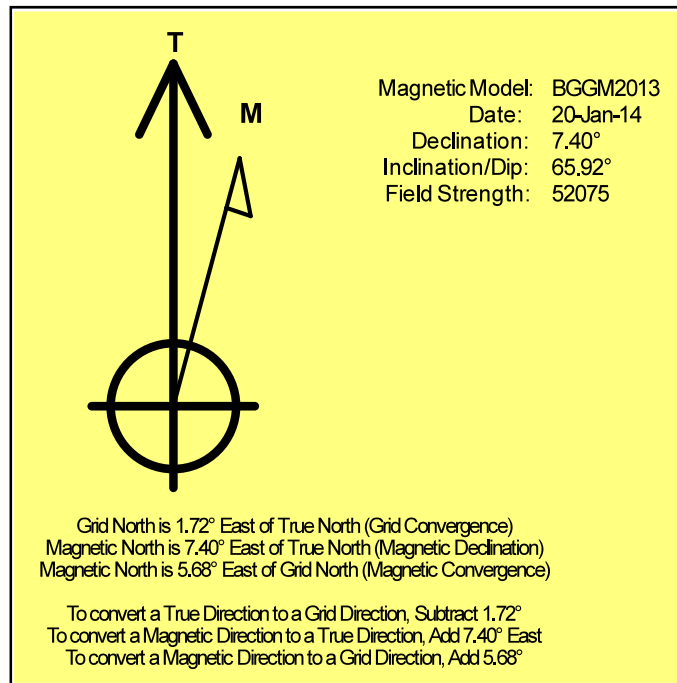
Grid Coordinates of Well: 1,335,498.25 usft N, 3,775,968.52 usft E

Geographical Coordinates of Well: 38° 43' 21.49" N, 102° 46' 47.17" W

Grid Convergence at Surface is: 1.72°

Based upon Minimum Curvature type calculations, at a Measured Depth of 5,914.00usft
the Bottom Hole Displacement is 23.53usft in the Direction of 291.54° (True).

Magnetic Convergence at surface is: -5.68° (20 January 2014, , BGGM2013)



Anadarko Petroleum Corp.

Cheyenne County, CO (NAD 83)

Sec. 21-T15S-R48W

CABOOSE 1548-21-44 SWD

Plan A

Design: Actual Field Surveys

Sperry Drilling Services

Geodetic Report

20 February, 2014

Well Coordinates: 1,335,498.25 N, 3,775,968.52 E (38° 43' 21.49" N, 102° 46' 47.17" W)

Ground Level: 4,254.00 usft

Local Coordinate Origin:

Viewing Datum:

TVDs to System:

North Reference:

Unit System:

Geodetic Scale Factor Applied

Version: 5000.1 Build: 70

Centered on Well CABOOSE 1548-21-44 SWD

RKB = 19' @ 4273.00usft (Pioneer 54)

N

True

Dec-Deg - API - US Survey Feet - Custom

HALLIBURTON

Design Report for CABOOSE 1548-21-44 SWD - Actual Field Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Geographic Coordinates		UTM Coordinates	
				+N/-S (usft)	+E/-W (usft)	Latitude (usft)	Longitude (usft)	Northing (usft)	Easting (usft)
0.00	0.00	0.00	0.00	0.00	0.00	38.722635	-102.779769	1,335,498.25	3,775,968.52
117.00	0.77	63.03	117.00	0.36	0.70	38.722636	-102.779767	1,335,498.63	3,775,969.21
207.00	0.51	130.49	206.99	0.37	1.54	38.722636	-102.779764	1,335,498.67	3,775,970.06
297.00	0.53	67.08	296.99	0.27	2.23	38.722636	-102.779761	1,335,498.59	3,775,970.75
386.00	0.58	208.61	385.99	0.04	2.40	38.722635	-102.779761	1,335,498.36	3,775,970.92
469.00	0.56	181.92	468.98	-0.74	2.18	38.722633	-102.779762	1,335,497.58	3,775,970.73
523.00	1.12	165.33	522.98	-1.51	2.31	38.722631	-102.779761	1,335,496.81	3,775,970.87
534.00	1.24	163.82	533.97	-1.73	2.37	38.722630	-102.779761	1,335,496.59	3,775,970.94
595.00	1.51	160.67	594.96	-3.12	2.82	38.722626	-102.779759	1,335,495.21	3,775,971.43
686.00	1.32	166.73	685.93	-5.27	3.45	38.722621	-102.779757	1,335,493.08	3,775,972.13
777.00	1.11	171.64	776.91	-7.17	3.82	38.722615	-102.779756	1,335,491.20	3,775,972.56
868.00	0.83	157.44	867.90	-8.65	4.20	38.722611	-102.779755	1,335,489.73	3,775,972.99
959.00	0.44	153.73	958.89	-9.57	4.61	38.722609	-102.779753	1,335,488.82	3,775,973.42
1,051.00	0.59	147.34	1,050.89	-10.28	5.02	38.722607	-102.779752	1,335,488.12	3,775,973.85
1,142.00	0.40	108.78	1,141.88	-10.78	5.58	38.722605	-102.779750	1,335,487.64	3,775,974.42
1,233.00	0.56	108.91	1,232.88	-11.03	6.30	38.722605	-102.779747	1,335,487.42	3,775,975.15
1,323.00	0.79	103.31	1,322.87	-11.31	7.32	38.722604	-102.779744	1,335,487.16	3,775,976.18
1,418.00	0.94	96.32	1,417.86	-11.55	8.73	38.722603	-102.779739	1,335,486.97	3,775,977.60
1,513.00	0.97	101.61	1,512.85	-11.80	10.29	38.722603	-102.779733	1,335,486.77	3,775,979.16
1,608.00	0.68	116.01	1,607.84	-12.21	11.59	38.722601	-102.779729	1,335,486.40	3,775,980.47
1,703.00	0.31	108.34	1,702.84	-12.53	12.34	38.722601	-102.779726	1,335,486.09	3,775,981.23
1,798.00	0.33	100.13	1,797.83	-12.66	12.85	38.722600	-102.779724	1,335,485.98	3,775,981.75
1,894.00	0.45	122.68	1,893.83	-12.91	13.44	38.722600	-102.779722	1,335,485.74	3,775,982.34
1,989.00	0.90	134.52	1,988.83	-13.64	14.29	38.722598	-102.779719	1,335,485.04	3,775,983.21
2,084.00	0.62	136.22	2,083.82	-14.53	15.17	38.722595	-102.779716	1,335,484.18	3,775,984.13
2,179.00	0.33	203.39	2,178.81	-15.16	15.42	38.722593	-102.779715	1,335,483.56	3,775,984.39
2,274.00	0.12	272.64	2,273.81	-15.40	15.21	38.722593	-102.779716	1,335,483.31	3,775,984.19
2,369.00	0.32	318.90	2,368.81	-15.20	14.94	38.722593	-102.779717	1,335,483.51	3,775,983.91
2,464.00	0.56	339.19	2,463.81	-14.56	14.60	38.722595	-102.779718	1,335,484.13	3,775,983.55
2,559.00	1.31	352.28	2,558.80	-13.05	14.29	38.722599	-102.779719	1,335,485.63	3,775,983.20
2,654.00	1.74	348.91	2,653.76	-10.56	13.86	38.722606	-102.779721	1,335,488.11	3,775,982.70
2,736.00	1.81	334.40	2,735.72	-8.17	13.07	38.722613	-102.779723	1,335,490.47	3,775,981.83
2,785.00	2.12	346.36	2,784.70	-6.59	12.52	38.722617	-102.779725	1,335,492.03	3,775,981.23
2,790.00	2.16	347.37	2,789.69	-6.41	12.47	38.722617	-102.779726	1,335,492.21	3,775,981.19
2,845.00	1.57	341.88	2,844.66	-4.68	12.01	38.722622	-102.779727	1,335,493.93	3,775,980.67
2,940.00	0.93	318.82	2,939.64	-2.87	11.10	38.722627	-102.779730	1,335,495.72	3,775,979.71
3,035.00	0.96	319.04	3,034.63	-1.68	10.07	38.722630	-102.779734	1,335,496.87	3,775,978.64
3,131.00	1.00	326.03	3,130.61	-0.38	9.08	38.722634	-102.779737	1,335,498.14	3,775,977.61
3,226.00	1.00	323.27	3,225.60	0.97	8.12	38.722638	-102.779741	1,335,499.46	3,775,976.61
3,321.00	1.19	328.29	3,320.58	2.47	7.10	38.722642	-102.779744	1,335,500.93	3,775,975.55
3,416.00	1.23	333.00	3,415.56	4.22	6.12	38.722647	-102.779748	1,335,502.65	3,775,974.52
3,511.00	1.27	330.66	3,510.54	6.05	5.14	38.722652	-102.779751	1,335,504.45	3,775,973.48

Design Report for CABOOSE 1548-21-44 SWD - Actual Field Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Geographic Coordinates		UTM Coordinates	
				+N/-S (usft)	+E/-W (usft)	Latitude (usft)	Longitude (usft)	Northing (usft)	Easting (usft)
3,607.00	1.20	330.87	3,606.52	7.85	4.13	38.722657	-102.779755	1,335,506.22	3,775,972.42
3,702.00	1.22	332.51	3,701.49	9.62	3.18	38.722661	-102.779758	1,335,507.96	3,775,971.42
3,797.00	1.10	332.23	3,796.47	11.32	2.29	38.722666	-102.779761	1,335,509.63	3,775,970.47
3,892.00	1.11	334.91	3,891.46	12.96	1.48	38.722671	-102.779764	1,335,511.25	3,775,969.61
3,988.00	1.08	333.13	3,987.44	14.61	0.67	38.722675	-102.779767	1,335,512.87	3,775,968.76
4,083.00	1.00	336.58	4,082.42	16.17	-0.06	38.722679	-102.779769	1,335,514.41	3,775,967.98
4,177.00	0.94	333.72	4,176.41	17.62	-0.73	38.722683	-102.779772	1,335,515.83	3,775,967.27
4,273.00	0.94	329.67	4,272.40	19.00	-1.48	38.722687	-102.779774	1,335,517.20	3,775,966.48
4,368.00	1.00	325.92	4,367.38	20.36	-2.33	38.722691	-102.779777	1,335,518.53	3,775,965.58
4,463.00	1.05	326.17	4,462.37	21.77	-3.28	38.722695	-102.779781	1,335,519.91	3,775,964.59
4,559.00	1.00	323.10	4,558.35	23.17	-4.28	38.722699	-102.779784	1,335,521.28	3,775,963.56
4,654.00	0.44	241.13	4,653.35	23.66	-5.09	38.722700	-102.779787	1,335,521.74	3,775,962.73
4,749.00	0.74	218.24	4,748.34	23.00	-5.79	38.722698	-102.779790	1,335,521.06	3,775,962.05
4,844.00	0.80	216.98	4,843.33	21.99	-6.57	38.722695	-102.779792	1,335,520.03	3,775,961.30
4,939.00	0.72	210.39	4,938.33	20.94	-7.27	38.722692	-102.779795	1,335,518.96	3,775,960.63
5,035.00	0.88	204.27	5,034.32	19.75	-7.88	38.722689	-102.779797	1,335,517.75	3,775,960.06
5,130.00	1.18	196.95	5,129.30	18.15	-8.46	38.722685	-102.779799	1,335,516.14	3,775,959.52
5,225.00	1.11	195.99	5,224.28	16.33	-9.00	38.722680	-102.779801	1,335,514.30	3,775,959.04
5,358.00	1.10	193.34	5,357.26	13.85	-9.65	38.722673	-102.779803	1,335,511.80	3,775,958.46
5,410.84	1.28	201.00	5,410.09	12.81	-9.98	38.722670	-102.779804	1,335,510.75	3,775,958.17
5,474.00	1.51	207.67	5,473.23	11.41	-10.62	38.722666	-102.779806	1,335,509.34	3,775,957.57
5,537.00	1.31	227.44	5,536.21	10.19	-11.54	38.722663	-102.779810	1,335,508.09	3,775,956.69
5,632.00	1.15	282.30	5,631.19	9.66	-13.27	38.722662	-102.779816	1,335,507.51	3,775,954.98
5,725.00	1.33	294.38	5,724.17	10.30	-15.16	38.722663	-102.779822	1,335,508.09	3,775,953.06
5,855.00	2.69	246.88	5,854.09	9.73	-19.34	38.722662	-102.779837	1,335,507.39	3,775,948.90
5,914.00	2.69	246.88	5,913.03	8.64	-21.89	38.722659	-102.779846	1,335,506.23	3,775,946.39

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
117.00	117.00	0.36	0.70	First MWD Survey @ 117.00ft
5,855.00	5,854.09	9.73	-19.34	Final MWD Survey @ 5855.00ft
5,914.00	5,913.03	8.64	-21.89	Str. Line Proj to Bit @ 5914' MD :: 5913.03' TVD

Design Report for CABOOSE 1548-21-44 SWD - Actual Field Surveys

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/_S (usft)	Origin +E/-W (usft)	Start TVD (usft)
User	No Target (Freehand)	325.12	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
117.00	5,855.00	MWD Vertical Surveys	MWD+SC

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
523.00	522.98	13 3/8" Casing Set @ 523' MD :: 522.98' TVD	13-3/8	17-1/2
2,785.00	2,784.70	9 5/8" Casing Set @ 2785' MD :: 2784.70' TVD	9-5/8	12-1/4
5,410.84	5,410.09	7" Casing Set @ 5410.84' MD :: 5410.09' TVD	7	8-3/4

Design Targets

Shape	Target Name	TVD (')	Northing (')	Easting (')	+N/-S	+E/-W	Created	Updated
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Directional Difficulty Index

Average Dogleg over Survey:	0.37 °/100usft	Maximum Dogleg over Survey:	1.57 °/100usft at 5,855.00 usft
Net Tortousity applicable to Plans:	0.37 °/100usft	Directional Difficulty Index:	3.331

Audit Info

North Reference Sheet for Sec. 21-T15S-R48W - CABOOSE 1548-21-44 SWD - Plan A

All data is in US Feet unless otherwise stated. Directions and Coordinates are relative to True North Reference.

Vertical Depths are relative to RKB = 19' @ 4273.00usft (Pioneer 54). Northing and Easting are relative to CABOOSE 1548-21-44 SWD

Coordinate System is US State Plane 1983, Colorado Central Zone using datum North American Datum 1983, ellipsoid GRS 1980

Projection method is Lambert Conformal Conic (2 parallel)

Central Meridian is -105.500000°, Longitude Origin:0.000000°, Latitude Origin:39.750000°

False Easting: 3,000,000.00usft, False Northing: 1,000,000.00usft, Scale Reduction: 0.99995759

Grid Coordinates of Well: 1,335,498.25 usft N, 3,775,968.52 usft E

Geographical Coordinates of Well: 38° 43' 21.49" N, 102° 46' 47.17" W

Grid Convergence at Surface is: 1.72°

Based upon Minimum Curvature type calculations, at a Measured Depth of 5,914.00usft

the Bottom Hole Displacement is 23.53usft in the Direction of 291.54° (True).

Magnetic Convergence at surface is: -5.68° (20 January 2014, , BGGM2013)

